

Patent Claims

1. Intervertebral implant (1), specifically an artificial intervertebral disk, with a central axis (2), an upper section (10), suitable for laying onto the base plate of a vertebral body lying above and a lower section (20) suitable for laying onto the cover plate of a vertebral body lying below, wherein
 - A) the upper section (10) is provided with a ventral side area (11), a dorsal side area (12), two lateral side areas (13,14), a top apposition surface (15) and a bottom surface (16);
 - B) the lower section (20) is provided with a ventral side area (21), a dorsal side area (22), two lateral side areas (23,24), a bottom apposition surface (25) and a top surface (26);
 - C) the two sections (10,20) moveable in relation to each other by means of two joints (38;39) arranged between the two sections (10;20), wherein
 - D) each of the joints (38;39) is provided with a swivel axle (3;4) and the two swivel axles (3;4) are arranged perpendicular to each other; and
 - E) the two joints (38;39) are realised by means of an upper joint element (31) connected with the upper section (10), a central joint element (32) and a lower joint element (33) connected with the lower section (20), characterised in that
 - F) each joint (38;39) comprising a first joint section (31;32;33) with an elevation (49;50) having an edge (51;53) for the bearing of a second joint section (31;32;33) in a way that allows tilting around the swivel axle (3;4).
2. Intervertebral implant (1) according to Claim 1, characterised in that the lower joint section (33) comprises an elevation (50) provided with an edge (51) for bearing of the central joint section (31;32) in a way that allows tilting around the swivel axle (4).
3. Intervertebral implant (1) according to Claim 1 or 2, characterised in that the upper joint element (33) comprises an elevation (49) provided with an edge (53) for bearing of the central joint section (32) in a way that allows tilting around the swivel axle (3).

4. Intervertebral implant (1) according to one of the claims 1 to 3, characterised in that the second joint section (31;32;33) comprises a depression (52;54) for receiving the elevation (49;509) on the first joint section (31;32;33).
5. Intervertebral implant (1) according to Claims 4, characterised in that the lower joint section (33) comprises an elevation (50) parallel to the swivel axle (4) with an edge (51) forming the swivel axle (4), and wherein this elevation (50) is carried in the depression (52) on the central joint section (32).
6. Intervertebral implant (1) according to Claim 4 or Claim 5, characterised in that the upper joint section (31) comprises an elevation (49) parallel to the swivel axle (3) with an edge (53) forming the swivel axle (3), and wherein the elevation (49) is carried in a depression (54) on the central joint section (32).
7. Intervertebral implant (1) according to one of the claims 1 to 6, characterised in that the swivel axles (3;4) are warped in relation to each other.
8. Intervertebral implant (1) according to one of the claims 1 to 7, characterised in that a means (40) is provided that keeps the two sections (10;20), measured at their ventral side areas (11;21), at a fixed distance from each other.
9. Intervertebral implant (1) according to one of the claims 1 to 7, characterised in that a means (40) is provided that is suitable for causing temporary blocking of the mobility of the two sections (10,20) around the joints (38;39).
10. Intervertebral implant (1) according to Claim 8 or Claim 9, characterised in that the means (40) can be attached to the two ventral side areas (11,21) of the two sections (10;20).
11. Intervertebral implant (1) according to Claim 9 or Claim 10, characterised in that the means (40) comprises an insert (41) with a lower end (45) and an upper end (46) and a depression (42;43) in the surfaces (16;26) at each of the two sections (10;20), which are open on the ventral side areas (11;21), and that the insert (41) with its ends (45;46) can be inserted into each of the depressions (42;43).

12. Intervertebral implant (1) according to Claim 11, characterised in that the depressions (42;43) are dovetail guides and the ends (45;46) on the insert (41) are arranged complementary to these dovetail guides.
13. Intervertebral implant (1) according to Claim 12, characterised in that the dovetail guides are tapered from the ventral side areas (11;21) towards the dorsal side areas (12;22).
14. Intervertebral implant (1) according to one of the claims 1 to 13, characterised in that the upper and the lower sections (10;20) each comprises at least two drill holes (80) running through from the ventral side areas (11;21) to the apposition surfaces (15;25) with longitudinal axes (83) for receiving bone fixation devices (81).
15. Intervertebral implant (1) according to Claim 14, characterised in that the longitudinal axes (83) of the drill holes (80) make an angle γ with the central axis (2).
16. Intervertebral implant (1) according to Claim 15, characterised in that the angle γ lies in a range of between 20° and 65°.
17. Intervertebral implant (1) according to one of the claims 14 to 16, characterised in that the longitudinal axes (83) of the drill holes (80) as seen from the ventral side areas (11;21) diverge from the inner surfaces (16;26) against the apposition surfaces (15;25).
18. Intervertebral implant (1) according to one of the claims 14 to 17, characterised in that the drill holes (80) are conically tapered towards the apposition surfaces (15;25).
19. Intervertebral implant (1) according to one of the claims 14 to 18, characterised in that the drill holes (80) are provided with an internal thread (82).
20. Intervertebral implant (1) according to one of the Claims 1 to 19, characterised in that the central joint section (32) comprises a first catching means (100) and the lower joint section (33) comprises a second catching means (105), and that the first and second catching means (100;105) can be engaged with each other.

21. Intervertebral implant (1) according to one of the Claims 1 to 20, characterised in that hinges (120) are attached between the upper joint section (31) and the central joint section (32), through which the two joint sections (31;32) are held together parallel to the central axle (2) without this causing any restriction of the rotation movement of the two joint sections (31;32) relative to each other around the first swivel axle (3).

22. Process for the replacement of a defect, natural intervertebral disk characterised by an intervertebral implant, with the steps:

- A) blocking of the joint(s) (38;39) of an intervertebral implant (1) through the special means (40) in a certain position of the joint(s) (38;39);
- B) insertion of the intervertebral implant (1) into the intervertebral space to be treated;
- C) release and removal of the device (40) inserted into the intervertebral implant (1) for blocking the joint(s) (38;39).

23. Process according to Claim 22, characterised in that it additionally comprises the subsequent blocking of the joint(s) (38;39) on the implanted intervertebral implant (1) through the means (40).

Summary

1. Intervertebral implant (1), specifically an artificial intervertebral disk, with a central axis (2), an upper section (10), suitable for laying onto the base plate of a vertebral body lying on top and a lower section (20), suitable for laying onto the cover plate of a vertebral body lying below, wherein
 - A) the upper section (10) is provided with a ventral side area (11), a dorsal side area (12), two lateral side areas (13,14), a top apposition surface (15) and a bottom surface (16);
 - B) the lower section (20) is provided with a ventral side area (21), a dorsal side area (22), two lateral side areas (23,24), a bottom apposition surface (25) and a top surface (26);
 - C) the two sections (10,20) are moveable in relation to each other by means of two joints (38;39) arranged between the two sections (10;20), wherein
 - D) each of the joints (38;39) has a swivel axle (3;4) and the two swivel axles (3;4) are arranged perpendicular to each other; and
 - E) the two joints (38;39) are realised by means of an upper, a central and a lower joint section (31;32;33), characterised in that
 - F) each joint (38;39) comprises a first joint section (31;32;33) with an elevation (49;50) provided with an edge (51;53) for the bearing of a second joint section (31;32;33) in a way that allows titling around the swivel axle (3;4).